CHALLENGES FOR CONSERVATION OF ETHNOMEDICINAL PLANTS IN GUJARAT STATE

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Abstract: Medicinal plants are important constituents of floral biodiversity in forests and collection of medicinal plants is also an important source of substance and livelihood to millions of poor people living in and around forest. According to World Health Organization about 80% of the world's population depends on traditional medicine for their primary health care. Between 40,000 and 50,000 plant species are known to be used in traditional and modern medicine systems throughout the world.
Gujarat (India) due to wide range of physical features and climatic conditions has diverse ecological habitats having floristic diversity of 4320 plant species. The state has 1315 recorded species of medicinal value which include 754 herb species, 248 tree species, 165 shrubs and 148 climbers. The tribal population (15%) of state,represented by about 30 ethnic groups,have the traditional knowledge and wisdom about the medicinal values of at least 500 plant species, however approximately 179 species are being used bylocal practitioners. This traditional knowledge about medicinal plants is being lost rapidly with the introduction of modern allopathic medicines, changing life style and migration of peoples to cities.
On the other hand poverty, marginal agriculture, increased market demand, insufficient leadership, lack of motivation and awareness, local politics, breakdown of rule enforcement and absence of secure and enforceable exclusive-use rights have left natural resources plundered and exploited beyond the limits of their regenerative capacities, and also pushes some species to the verge of extinction. This indicates the need for developing a conservation strategy based on analysis of threats to ethno-medicinal plants and to revitalize knowledge related to them.

Keywords: Traditional Knowledge, Medicinal Plants, Gujarat, Conservation.

Introduction: Traditional medicine is one of the important health care systems practiced widely. According to World Health Organization (WHO) about 80% of the world's population depends on traditional medicine for their primary health care. Between 40,000 and 50,000 plant species are known to be used in traditional and modern medicine systems throughout the world. India has probably the oldest, richest and most diverse cultural traditions in the use of medicinal plants and over 7500 species of plants are used by several ethnic communities.

The indigenous traditional knowledge of medicinal plants of various ethnic communities, where it has been transmitted orally for centuries is fast disappearing from the face of the earth due to the advent of modern technology and transformation of traditional culture. There is an urgent need to document the ethno biological information presently existing among the diverse communities before the traditional knowledge is completely lost.

The state of Gujarat contributes to country's biodiversity in a big way. Despite, its adverse geo-climatic conditions, the state have a remarkable diversity of plant species (13% of the flora of India) owing to its four bio- geographic zones and five biotic provinces. This diversity is manifested in about 4320 plant species and medicinal flora forms a major component of this biodiversity. The floristic diversity of Gujarat shows 2,205 species of higher plants including 27 species of mangroves. The state has 1315 recorded species of medicinal value. These include 754 herb species, 248 tree species, 165 shrubs and 148 climbers, 1016 plant species are wild where as 299 species are being under cultivation or plantation (Pandey *et al*., 2005).

About 15% of Gujarat state population is tribal, which is represented by about 30 ethnic groups, well distributed in the southern and eastern part of the state, which incidentally coincides with the best forested areas. Important ethnic groups are of *Bhil, Dhodiya, kolcha, koli, konkni, Gond, Gamit, Valvi, Talvi, Padhar, Pateliya, Rathava, Siddi, Waghri*, etc. These tribal people mainly depend on forest for their shelter, housing

material, food, fuel, fiber and feed. These ethnic groups through their observations and experiences with the nature, have developed their own indigenous systems of treating ailments using different plants. In Gujarat the traditional practitioners amongst these ethnic groups are commonly known as 'Bhubas', 'vaidyas', 'bhagats', etc. About 760 species of medicinal plants and 450 species of economically valuable plants used by local tribes have been identified so far.

According to one of the study, these people have the traditional knowledge and wisdom about the medicinal values of at least 500 plant species, however approximately 179 species are being used by these local practitioners.

Table 1 - Habits of Species Utilised By Ethnic People in the State

Habits	*Total no. of medicinal species in the state*	*No. of species used by ethnic groups*
Trees	248	82
Shrubs	165	22
Herbs	754	45
Climber	148	30
Total	**1315**	**179**

(Source: Pandey et al., 2005)

Gujarat is one of the industrially developed states and there are more than 605 ayurvedic pharmaceutical industries, which are using medicinal plant parts as raw material. According to a survey, 270 medicinal plants are being consumed by these units, out of which 201 species are indigenous and 69 species are imported from elsewhere. Out of 201 indigenous medicinal plants, 148 species (74%) are growing in wild and other 53 species (26%) are cultivated as crops. Out of 148 wild plants, 48 species of trees (32%), 22 species of shrubs (15%), 28 species of climbers (19%) and 50 species of herbs were found. A rough estimate revealed that these industries are using 3,755 metric tonne of plant parts annually.

Among the medicinal plants used by pharmaceutical industries, *Azadirachta indica, Terminalia bellarica* and *Terminalia arjuna* were used by all. This is followed by *Aloe barbadense, Asparagus racemose, Casia italica var.micrantha, Crateva nurvala, Curculigo orchiodes* and *Melia azadirachta* which are used by 80% of pharmaceutical industries. The survey also revealed that these units are experiencing the shortage of raw material for the plant products from species like *Aegle marmelos, Aloe barbadense, Asparagus racemose, Casia italica var.micrantha, Crateva nurvala, Curculigo orchiodes, Clerodendrum multiflorum, Desmodium gagenticum, Gmelina arborea, Melia azadirachta, Oroxylum indicum, Steteospermum suaveolens, Solanum indicum, Solanum surattens, Tribulus terrestris, and Uraria picta* etc. It is also pertinent to mention that according to the survey, 90% of these medicinal plant species are being collected wild, mostly from forest areas and the existing natural resource is not commensurate with the growing demand.

The study also emphasised upon the demand and supply of wild medicinal plants. The total demand of the industries has been pegged at 3,755 metric tonne annually out of 270 medicinal plants. The demand of 148 wild species was found 2,499 metric tonne against the supply of 980 metric tonne (39 per cent) out of 65 species. The rest of the wild species are collected but not recorded. The summary of demand and supply gap of indigenous medicinal plants (wild) with quantity is given in Table 2.

Table 2 - Status of Demand and Supply Scenario of Wild Medicinal Plants

Sr. No.	*Plant Groups*	*No. of Species consumed*	*Quantity (Mt.)*	*No. of species collected*	*Quantity (Mt.)*	*Difference*	
						No. of species	*Quantity (Mt.)*
1	Trees	48	788	24	782	-24	-06
2	Shrubs	22	278	08	55	-14	-223
3	Climbers	28	642	11	13	-17	-629
4	Herbs	50	791	22	330	-28	-661
	Total	**148**	**2499**	**65**	**980**	**-83**	**-1519**

(Source: Medicinal plants of Gujarat, GEER Foundation, Gandhinagar)

It is evident that out of 148 wild medicinal plants, only 65 species (45%) are collected authentically and legally while 83 species (55 %) are also collected from the wild and supplied to the pharmacies through their well established middle men network but remained undocumented. It is an eye opener that indigenous species are supplied largely, exploited ruthlessly and left the species endangered in nature. Out of these 148 medicinal plants 50 plants, including 16 trees, 8 shrubs, 12 climbers and 14 herbs, were discussed as threatened (Singh, A.P., 2003).

Out of 1315 medicinal plants, 102 species are of conservation concern and 76 are naturally rare ones. On the other hand, 186 species are commercially utilized and traded; whereas 108 species are highly traded in Gujarat state. These species have both commercial along with ecological significance. The increasing pressure of commercial demand over the species is one of the major factors, which has caused the depletion in natural habitat. Some of the species are facing a very high level of danger and few of them which occur in this zone are also getting reflected in the threatened category. There are three medicinal plants occurring in this zone are enlisted in red data list of IUCN (*Dalbergia latifolia*, *Santalum album* and *Saraca asoca).*The focussed conservation programme for such species is certainly going to be a constructive step towards the saving of these threatened and valuable species.

Wild plant species used for medicinal purposes continue to support indigenous and local communities that have relied on them for centuries for their traditional medicines. Indigenous knowledge related to medicinal plants has a significant role in making rural communities self-reliant in primary health care, in supporting livelihoods, certain of knowledge resources and generating rural employment. Loss in knowledge will make future generations ignorant of them and will not protect from grazing or other exploitation or make any special conservation arrangements. Similarly, loss of species will lead to loss of knowledge of its use. Both loss of species or knowledge will affect indigenous people and many others who are dependent on them for treating illnesses.

Several human induced and some natural threats have threatened the future of several medicinal plants that are very important to human beings. The extinction or threat to medicinal plants has also threatened loss of traditional knowledge related to them and their ecology. To address these threats initiation to implement long term strategies at the global, national and local levels for conservation of medicinal plant resource and using their rich associated traditional knowledge, for social, culture and economic benefits. For this, commitment is needed from all sectors of the society including the government, NGO's, industries, political bodies/leaders, scientists, civil societies and rural communities. There should be an integrated approach for holistic conversation management so that the harvest will be sustainable, collection regularized by the certifying products, to formulate policies to conserve habitats, supply by encouraging cultivation and decrease wild collections and protect traditional knowledge. But to develop such holistic conservation efforts it is necessary to generate information on the status of different medicinal plants and traditional knowledge, dependency of indigenous and rural communities on wild plants in different regions.

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